



**2008 European Powertrain Market  
Product Innovation Award**



*“We accelerate growth”*

## 2008 European Powertrain Market Product Innovation Award

### Award Description

The Frost & Sullivan Award for Product Innovation is presented to the company that has best demonstrated the ability to develop and/or advance products with more innovative capabilities than competing vendors and products. This Award recognises the company's successful adoption of new or existing technology that has become a part of its well-designed product family. Such innovation is expected to significantly contribute to the industry in terms of product performance and degree/rate of technical change.

### Research Methodology

To choose a recipient of this Award, the analyst team tracks all new product launches, product differentiation strategies, R&D spending, products in development, and new product features and modifications. This is accomplished through interviews with the market participants and extensive secondary and technology research. The data compiled through this research is analyzed based upon specific measurement criteria for this Award. Participants are then ranked with respect to the measurement criteria. Frost & Sullivan then presents the Award to the company that received the number one rank.

### Measurement Criteria

In addition to the methodology described above, there are specific criteria used to determine final competitor rankings in this industry. The recipient of this Award has excelled based on one or more of the following criteria:

- Significance of new product(s) in its industry
- Competitive advantage of new product(s) in its industry
- Degree of differentiation innovation compared to other market participants
- Benefits to end-users due to product differentiation
- Effect of product differentiation on ease of adaptability for new end-user applications
- Product innovation in terms of unique or revolutionary technology
- Product acceptance in the marketplace
- New product value-added services provided to customers
- Number of competitors with similar product(s)



The “2008 European Powertrain Market Product Innovation Award” is presented to Rotrex A/S. The award is in recognition of the company’s dedication towards the development and manufacture of boosting technologies within the European powertrain market. Rotrex A/S has achieved this by introducing innovative products to vehicle manufacturers and working with vehicle manufacturers to downsize engines, as can particularly be seen through the supercharger it developed for a German vehicle manufacturer to be used in a downsized engine.

### **Innovations from Rotrex A/S**

Rotrex A/S has developed a supercharger for use in downsized engines. There is an increase in the use of boosting technologies such as superchargers mainly in order to make up for loss of power due to engine downsizing. Engine downsizing is a trend that most original equipment manufacturers (OEM's) have been following in order to reduce emissions. Downsizing an internal combustion engine reduces its volumetric capacity and hence affects engine performance and drivability. Forced induction systems such as superchargers are one of the leading technologies of today, which enable performance to be retained at the same time as offering the advantages of downsizing.

Rotrex A/S is a leading manufacturer of superchargers. The patented planetary drive used by Rotrex A/S in its superchargers allows speeds up to 300,000rpm, as fast as, or faster than any turbocharger. Additionally, a Rotrex based solution imposes no exhaust manifold restriction (inherently part of any turbo solution). Further advantages of the Rotrex technology are the high efficiency, compactness, reliability and silent operation. Other main areas of focus of Rotrex A/S are downsizing, hybrid powertrains, fuel cell's, performance vehicles and exhaust gas after treatment for truck /off-road.

### **The Rotrex A/S difference**

Superchargers can provide better drivability than turbochargers, but when a system is developed with good boost at low engine speeds it usually becomes inefficient at high engine speeds. This drawback of superchargers calls for the need of a multispeed supercharger drive which can deliver optimum boost conditions when needed. Rotrex A/S can achieve this using two, three or continuously-variable speed gearbox coupled to the Rotrex A/S traction drive depending on the requirement. The two modules clipped together act as a single unit but is more compact than a conventional supercharger. Other market participants in Europe manufacture roots and screw type superchargers. The efficiencies of these superchargers trail off at higher pressure ratios whereas Rotrex A/S superchargers provide the best thermodynamic efficiencies even under extreme temperatures. Rotrex A/S superchargers offer superior boost at low engine speeds because of it's ability to accommodate high speed impeller designs. The planetary traction drive, which are used in Rotrex A/S superchargers offer silent operation and less vibration which is an added advantage. These advantages of Rotrex A/S superchargers over superchargers manufactured by competitors help it grow in terms of market share and product sales.

### **Benefits to end-users**

For diesel and gasoline engine applications, a Rotrex A/S supercharger in combination with a variable drive or electric/hydraulic motor can be applied either alone or in combination with a larger wastegate turbocharger. By this method, engine response, fuel efficiency and reliability are improved (through lower thermal loads). It is also more cost competitive when compared to other advanced turbo systems. The above mentioned advantages of Rotrex A/S superchargers offering better thermodynamic efficiency provides better performance at all engine speeds. This added advantage allows the use of these superchargers in applications where responsiveness and performance are important such as sports models and high end models.

## Linking systems and forging ahead with OEM's – A dedicated approach by Rotrex A/S

OEM's are on the lookout for new and better boosting technologies keeping in mind lower emission levels. Rotrex A/S develops products that are unique and patented. A standard range of superchargers is available to suit a wide range of applications and it also customises products to meet specific client applications.

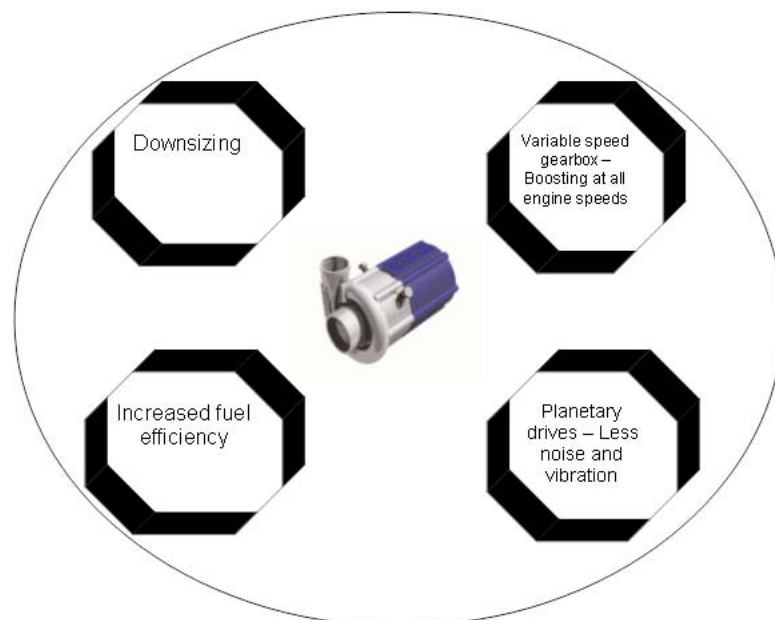
The company continues to develop customised applications for other OEM's as well. This dedication that Rotrex A/S shows towards working with OEM's in development of its products has helped build a strong brand image. The company is well known in Europe, has sales offices in the United States of America and has contacts/agents in Japan, India, Australia, South America and South Africa. This has helped Rotrex A/S reach out to most parts of the world. Currently, Rotrex A/S is working on downsizing projects which use superchargers combined with step-up, continuously variable transmission (CVT) and turbo technology. This trend of combining the development of boosting technologies and linking them to other systems such as transmissions is new in the market and are true innovations that the company is introducing in the market. Other companies manufacturing superchargers do not have such a product.

## Efficient quality control and high accuracy in product development

Every product from Rotrex A/S goes through an efficient and strict development process which follows the highest quality standards. The traction technology inside every Rotrex A/S supercharger demands components of high precision and accurate assembly. Some advantages of its patented traction drive design are compactness, high efficiency, reliability and low cost. The manufacturing process followed by Rotrex A/S is highly developed and involves efficient quality control and supply chain management. Before final release to the market, every product passes through demanding approval tests which are fully monitored and controlled.

## Conclusion

Rotrex A/S superchargers have forged ahead rapidly since it was first introduced in the early 1990's and received its first patent in 1996. Since then it has continuously improved in the supercharger market which has also linked them to various other systems within the vehicle which sets Rotrex A/S ahead of its competitors. The company's patented traction technology has helped it reach out to many OEM's and aftermarket companies worldwide. Simple and innovative solutions such as developing OEM and downsizing compatible superchargers that are economical, reliable and enable new combinations of forward pointing technologies have given Rotrex A/S an edge over its competitors. These cumulative factors make Rotrex A/S the deserving recipient of the "2008 European Powertrain Market Product Innovation Award."



## About Best Practices

Frost & Sullivan Best Practices Awards recognize companies in a variety of regional and global markets for demonstrating outstanding achievement and superior performance in areas such as leadership, technological innovation, customer service, and strategic product development. Industry analysts compare market participants and measure performance through in-depth interviews, analysis, and extensive secondary research in order to identify best practices in the industry.



## About Frost & Sullivan

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